1:Stanford U. S-4, 5 1956 AF15 East China
AF15

434 staff of state and private industrial and commercial enterprises, and other persons who do no manual labor are allowed 28 catties (30.8 pounds) of rice; (5) university and high school students are allowed 32 catties (35.2 pounds) of rice; (7) children under ten years will be divided into three grades to determine the amount each will receive. Free disposal of the surplus grains among themselves is permitted under the new regulation. Meats, eggs, and vegetables are not rationed at this time. In addition to grains, edible oil and cotton cloth have been rationed since 1950.

434 146 For the purpose of determining whether this system of rationing is adequate, it is necessary to appraise it in terms of caloric content. Using 3,430 calories for each kilogram of rice (two catties or 2.2 pounds) as the basis for calculation,[51] the daily caloric equivalent is shown in the table which follows.

51. T. H. Shen, Agricultural Resources of China, New York, 1951, p. 378.

434
146

Caloric Value of Rice Rations in Communist China*

Class of Workers	Quantity Rationed			Normal Caloric Requirements per Day (II)	Percentage of Deficiency $\frac{II-I}{I}$ = %
	Catties per Month	Pounds per Month	Caloric Equivalents per Day(I)		
Extra Hard Worker	50	55	2,860	4,800	68
Hard Worker	40	44	2,290	3,600	57
Ordinary Worker	32	35.2	1,830	3,000	64
Office Clerks	28	30.8	1,600	2,700	69
College or High School Students	32	35.2	1,830	3,000	64
Ordinary citizens and children above 10 years of age	25	27.5	1,430	2,400	68

* T H. Shen, Agricultural Resources of China, New York, 1951, p. 169.

1:Stanford U. S-4, 5 1956 AF15 East China AF15

434
146 It is evident that the amounts of rice rationed to various classes of workers are far below normal requirements as measured in terms of calories. With rice in short-supply, the people are often unable to buy their minimum ration.

438
443 Since 1951, in order to stimulate trade and to facilitate the interflow of commodities between city and country, the Chinese Communists have held a number of "Native Products Fairs" in most of the principal cities throughout East China.

[See table next page -- Analyst]

2: Murphy G-4 (no date) 1953 AF15 East China AF15

reported by Buck. According to his figures, the grain production (or equivalent) per male adult of the population (or equivalent) within this thirty-mile radius averages 2594 kilograms, as compared with an all-China average of 1400 kilograms.[9]

The problem of how Shanghai is fed is, however, not answered merely by the facts of fertile soil, intensive cultivation, and high crop yields in its immediate hinterland. While the delta is clearly productive, it is equally clearly densely populated, and it is likely that a larger proportion of the total population of the fertile triangle lives in cities than is the case in any other area of comparable size in China (map 5).

Buck estimates that the consumption of food energy on farms in this area is 3486 calories per adult-male unit per day, a high figure for a so-called subsistence agricultural economy, and exceeded in Buck's figures for China only by the rice-tea area immediately to the south.[10] Far from being a subsistence economy, the triangle supports a relatively commercialized agriculture. Buck estimates for example, that the farmers of this area sell 61 per cent of their farm products immediately after harvest, and that 60 per cent of farm products are sold (i.e., first sale) as far away as the nearest market town, as distinct from the local village. Both of these figures are exceeded only by those from the double-cropping rice area of Kwangtung.[11]

Assuming that the favorable natural environment and the intensive farming methods result in a total food production great enough to allow a surplus for feeding the delta's cities, how is it marketed in this pre-industrial economy? Cities of the magnitude of Shanghai have hitherto never developed except where mechanization and technological improvement in agriculture have been accompanied by the growth of railways, and later, highways.* Shanghai, competing for the food surplus of the delta with Hangchow, Nanking, Soochow, and other large delta cities, added well over three millions to its population between 1843 and 1936, while agricultural practices in the delta remained in general just as they

* Ancient Rome and Peking, both cities of approximately one million long before the industrial revolution, might constitute exceptions. Both owed their size primarily to their administrative functions, and both depended heavily on water transport.

2: Murphy G-4 (no date) 1953 AF15 East China AF15

438 With the exception of the planting season, the general price and
439 supply situation is dominated by local rice.

Although considerable amounts (unfortunately there is no record
432 of their size) of both domestic and foreign rice entering Shanghai
511 are resold to or originally ordered by other cities, relatively more of the foreign imports fall into this category. The table on page 146 above should therefore be interpreted in the light of the ultimate destination of the several categories of rice shipments arriving in the city. Total sales of rice in Shanghai, for which relatively more accurate figures are kept, provide a different indication of the city's rice consumption. Sales are estimated by the Food Commission's study as averaging annually 860,000,000 pounds during the period 1925–1930.* Their report assumes that the difference of nearly 100,000,000 pounds between this figure and the total recorded entries of 780,000,000 pounds is accounted for by unrecorded shipments arriving by creek and canal from nearby sources. Shipment of much or most of the foreign rice from Shanghai to other cities would leave an even greater gap between the two figures as measures of Shanghai's consumption, and it is logical to assume that this also is filled from local sources.

The figure for total sales, however, may not be an accurate indication of total consumption if we attempt to estimate the average annual rice consumption of a Chinese adult and multiply it by the population of Shanghai in 1930. A Chinese economist [21] suggests four piculs per year (532 pounds), which, using 3,250,000 as Shanghai's 1930 population (graph I) gives a total city consumption of 1,730,000,000 pounds. Or if we use a lower estimate of 400 pounds,[22] which agrees more closely with the writer's experience, and scale down this figure to 380 to allow for children, for other cereals and foods in the Shanghai diet (see above, p. 139), and for the non-rice-eating foreign population of the city (38,000 in 1930), we still arrive
• [146] at a figure of 1,235,000 pounds. This is equivalent to about 1,750 calories per day per capita from rice alone, certainly a minimum diet for a Chinese.

* This figure presumably includes spot sales of foreign rice by Shanghai brokers to dealers in other cities, but probably does not include foreign rice delivered in Shanghai on order from other cities.

3: Hinder G-5 (1938-1942) 1944 AF15 East China AF15

435 members of the Chinese community, purchased broken rice and
262 sold it through rice shops to the needy through eight periods of
633 several weeks each. A total of 223,200 bags was distributed, the organisation making a contribution of more than two million dollars, the difference between the cost of the rice and the returns through sales at lower prices. In a similar effort to supply food to the poor, from February 1940 onward, the larger Chinese flour mills made available several thousand bags of flour daily at considerably less than the market price, to be sold in small quantities, also through shops regularly selling flour. More than two and a half million bags of flour were thus provided. Several importing firms also played their part in handing over ten per cent of all incoming flour consignments, totalling 185,000 bags, to reliable dealers for sale to actual consumers. Important as these efforts were they could not ease to any great extent the difficult situation.

741 The very substantial arrivals of rice and wheat from the Amer-
262 ican Red Cross for relief purposes also played their part. This
146 grain was distributed to organisations caring for numbers of needy people. Many refugee camps, hospitals, and institutions caring for children were the recipients of this food. The form in which the wheat came proved to be particularly suitable. It was "cracked wheat," wheat submitted to the first processes of milling only, consisting of the whole grain merely cracked. In consequence the precious germ of the wheat was still present, containing within it the important vitamin B complex which is significant in nutrition and in the prevention of such recognised dietary deficiency diseases as beriberi. The nutritional results for those fortunate enough to receive it were dramatic. Instead of gross signs of deficiency and the less dangerous but serious malnutrition which were everywhere prevalent, by comparison a glowing health appeared in institutions using the cracked wheat, though it could not provide all the needed protective foods.

435 In August 1941, the Chinese Government ruled that foreign
633 exchange would be obtainable only through its Stabilisation Board.
439 It then appeared that an instrument might become available which
262 would give the Council actual power to control prices of imported staple products other than rice which was already controlled through the agreement with the Hongkong authorities. The Board was sympathetic to the view that exchange for essential commodities

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15

THE PUBLIC HEALTH DEPARTMENT of the Shanghai Municipal Council exercised constant and vigorous supervision over the food supplies of the Settlement. Both incoming livestock and meat supplies were carefully inspected, the erection of a modern abattoir by the Council in the last decade having materially contributed to a sound meat supply. Dairies increased in number, and, through the efforts of the authorities, improved in quality. The sale of milk was under strict control. Positive measures were taken to induce dairies to use modern procedures. Market produce was inspected daily, both on its way into the city from outlying farms and after it had been placed on sale; food vendors on the streets and all food shops and stalls were subjected to licence and supervised. Bakeries also came in for close attention. In short, all that could be done to reduce food contamination, and hence to limit the incidence of germ-borne disease, was done by the authorities.

IN THE LAST DECADE interest has been growing in China in the study of nutrition. Much useful scientific knowledge has been accumulated, particularly through the work of scientific investigators associated with the Henry Lester Institute of Medical Research, the Peking Union Medical College, and Yenching University. The existence in Shanghai of large camps of destitute refugees after the outbreak of hostilities in 1937 gave scientists a sad but useful opportunity to study the results of various minimal diets. Little of the available knowledge had received popular attention in the city.

Reference has been made to the fact that workers in many industrial undertakings, and indeed in many commercial enterprises, were housed and provided with food where they worked.[3] In larger plants food might be bought, cooked and served by the factory. In smaller ones the supply of food to workers was undertaken by a *pao fan-ti*, who delivered to factories food cooked elsewhere. Remuneration has been, then, for many workers partly in food. Under these circumstances it is important that a knowledge of nutrition, and of the effect of malnutrition on the health of employees, should be general. There has been a general acceptance of the obvious fact that if workers are not properly fed—and improper feeding is commonly associated only with insufficient food

[3] See Chapter IV.

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15

146 164 —they will not work well. What has been too little understood is that the wrong food as well as insufficient food can produce inefficiency and disease. Even before the 1937 refugee influx, beriberi was prevalent, especially among young workers newly arrived from the country and as yet ill adapted to the polished-rice diet of the city. On humid summer days it was not uncommon to have the Council's ambulance service report that a young worker had been taken to the hospital in a state of collapse, and that collapse was sometimes fatal. The cause of death often proved to be acute beriberi, an acute diet-deficiency disease which is induced by the absence from the diet of certain vitamins. This particular problem has been recognised by the authorities, and prior to the hostilities some beginning toward its solution had been made.

146 164 654 In 1937, the year of the outbreak of hostilities, an interesting dietary experiment was in progress in the eastern district of the International Settlement. Under the joint auspices of the Henry Lester Institute of Medical Research and the Industrial Division of the Council, some 75 young workers were fed in a "kitchen" established for the purpose. The scientific planning of the work was directed by Dr. B. S. Platt of the Institute. The boys were employed in the manufacture of flashlight bulbs, and while they worked were seated at benches, crouching over gas flames blowing glass and fixing filaments in glass rods. In the moist Shanghai summer the atmosphere of these workshops, which are usually in residences converted to industrial use, crowded and unsuitable, becomes almost unbearable. In the summer preceding the experiment, literally dozens of young workers had shown beriberi symptoms whose onset appeared to have been aggravated by the heat and humidity.

Leaving as controls certain of these flashlight factories to pursue their usual policy of food supply, the authorities induced the owners of three others to send their young workers to the kitchen for their meals three times daily. The owners paid an amount slightly less than they would have paid to other food suppliers—$4.60 per month per worker instead of $4.80.[4] The experiment began in February 1937, and was suspended when street fighting raged in the vicinity of the kitchen in the middle of August, six months later. During that half-year and through two and a half months of humid summer weather there was no evidence of any

[4] At pre-war dollar purchasing power.

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15

dietary-deficiency disease among the 75 workers fed in the kitchen, while many young workers in neighbouring factories acting as the scientific controls, were suffering from disease.

The country habit of storing rice in the husk, and dehusking only that portion which is necessary for the food of the family during the day, no longer holds for city life. Rice is dehusked in the country and transported husked and milled to the city to save transportation costs, and because highly milled rice keeps well. After long storing, however, residual fats present become rancid, and in order to make the rice palatable, it must be washed. First with the milling and later with the washing disappear the essential vitamin contents which prevent dietary-deficiency disease. The experiment was designed to prove that, if rice were stored in the husk, and only milled immediately prior to use, it was unnecessary to wash it, and the vitamin content, therefore, remained to check the onslaught of deficiency disease. No other change from normal food eaten in factories was made in the diet. No additional vegetables or fruits were given. Reliance was placed only on prevention of loss of vitamins in the rice.

The intention had been to make the kitchen the nucleus of a district food service which would apply the results of the study on a wider scale as a demonstration. It was ironic that war should have interrupted the experiment, and that it should not only have become impossible to make any application of the important facts demonstrated in the experiment, but that stocks of Chinese rice, milled or unhusked, should virtually disappear from the Shanghai market, and that the city should have to depend for the ensuing five years on imported rice, all husked, and very high in price.

It might be thought that, with the price of rice soaring out of all bounds, factory owners who supply food to their workers would reduce the quantity of rice supplied, mix it with other cereals, or vary it with beans. But both management and workers have a mistaken idea that, if at all possible. the usual number of bowls of rice must be provided, whatever happens to the "side dishes" of bean curd, vegetables, fish or, rarely, meat. In consequence, expensive imported polished de-vitaminised rice continued to be eaten in former quantities. If the "side dishes" were reduced, as they were in size and variety in order to decrease costs, this last source of nutrients also disappeared. It is small wonder, then, that by 1941, and

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15

before the even worse situation following Pacific hostilities, signs of deficiency disease were apparent even among workers fortunate enough to have full-time employment in factories.

There is much work for the Shanghai authorities of the future to do in the matter of food. The Public Health Department's long history of supervision of the city's food supply, its war against flies and fly-borne diseases, has represented one phase of the food issue. The Supply Committee's efforts to obtain actual supplies represents a second. Instruction, particularly of employers, in the nutrition aspects of food supplied to workers is a third necessity. The food intake of workers in certain factories where workers are both housed and fed has been analysed in the past and found to be woefully lacking. The attention of certain managements was called to this situation, and some improvement resulted.

The managements of 16 factories where doctors or nurses are employed were induced to keep records of food supplied with a view to seeing how near it came to nutrition standards. In 37 other plants also records were kept. Through these means there should in future be a decrease in dietary-deficiency diseases. Though the provision of food as part of earnings is to be deprecated, it is possible by this means to control for his good the worker's food much more easily than if individual housewives have to be taught what to do. On the other hand, unless the group feeding is right feeding, a whole working force can develop deficiency diseases. In the sense that workers had no option in many cases but to accept the food which the employers provide, it can be said that where deficiency disease resulted therefrom their wage was in fact disease.

THE NECESSITY FOR the education of management, workers, and the public generally in the foods which should be eaten to ensure health and prevent frank deficiency diseases was recognised by the Division. A film was in the making when Pacific hostilities caused suspension of the effort. Two western industrial enterprises and one Chinese had agreed to provide the $10,000 necessary for the film production. A food exhibit had been planned in co-operation with the Chinese Medical Association to take place in the industrial district. It was designed to demonstrate through graphic means the results of wrong feeding. The public would well be able to recognise in pictures the gross deficiency diseases which they

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15

could see around them every day—the swollen legs of beriberi, the serious eye affections sometimes producing blindness; what they had to be told by poster methods was that these were the results of vitamin deficiencies, and what should be eaten to avoid them.

744 146

This attempt at visual education, cut off by the war, may well be pursued in future. It would be one of the activities of a Nutrition Division of the Department of Public Health. It is certain that if the United Nations plans in the food realm mature, every country including China will have administrative nutrition programmes to safeguard the nation's health. These programmes will be planned nationally and will come into a distinctly active phase at the city level. A Nutrition Division in the future will surely refuse to permit deficiency diseases to hold sway, will insist that whatever methods of control are necessary will be taken to ensure that rice fresh enough to prevent beri-beri is available to people in the city. The opportunities, given peace and restoration of Chinese sovereignty in Occupied China, are endless.